EMPIRICAL ANALYSIS OF MARRIAGE AND EARNINGS

by

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ABSTRACT

This thesis studies the association of earnings and marital status. The relation between earnings and marriage is examined in two ways. One is concerned with whether marriage itself affects earnings. Another deals with the effect of expected earnings on age at marriage.

In this thesis, empirical analyses of the two marriage-earnings issues are presented. Using the 1% 1991 Hong Kong Census data, I study the marriage effects on earnings and find that both married men and women earn more than the unmarried counterparts. It is hypothesized that the marriage premium comes from the productivity enhanced by sharing of skills and knowledge with one's spouse inside a household, and the existence of such cross-productivity effect is supported by the results. It is further postulated that sharing of similar skills and knowledge are more efficient and beneficial, leading to the conclusion that higher cross-productivity effects exist when the couples are doing similar jobs. Empirical results support that couples doing similar jobs enjoy more cross-productivity premium, especially if both husband and wife are working in managerial class.

In addition, expected wage effects on age at marriage are investigated using the micro data of Taiwan. It is found that a positive and significant relation between the wage rate and age at marriage exists for men, whereas results for women are insignificant. An examination on duration of marriage effects on the wage

rate is carried out also using the Taiwan data. The duration of marriage effects is found to be insignificant.

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER I

INTRODUCTION

Marriage and earnings is one of the important research areas which deserves much attention. Noticing the earnings differentials among different individuals, economists try to find out the determinants of earnings. And, it is discovered that there is a strong association between earnings and marital status. Moreover, married men are found to earn more than unmarried men (Becker 1973, Benham 1974, Greenhalgh 1980, Kenny 1983, Wong 1986). Such cross-sectional earnings differentials persist even when personal characteristics are controlled. If marital status pay differentials reflects productivity differences, then it will imply that changes in the marital status composition of the labor force may affect the productivity of the labor force and thus the performance of an economy.

Another closely related issue concerns about the age differential between marriage partners. It is noted that men on average marry older than women. Economists attempt to find out the factors affecting age at marriage. It is found that wages are associated with age at marriage in such a way that men who expect to succeed tend to marry later than the low-wage men (Bagnoli and Bergstrom 1993).

Although a great deal of research has been done in this area, results and hypotheses are often different from one study to another. Moreover, little study has been done using Hong Kong and Taiwan data. Given the great difference in the culture and norms between Western society and Chinese society, the attitude towards marriage in these two societies may be different. Therefore, it is interesting to see whether the marriage effect hypothesis holds for Chinese societies. The purpose of this thesis is to provide a more in-depth analysis of marriage and earnings by making use of the Hong Kong and Taiwan data.

There are three hypotheses of marriage effect in the marriage and earnings literature. They are employer favoritism hypothesis, unobservables hypothesis and cross-productivity hypothesis. An overview of these three hypotheses will be presented in chapter II. Nevertheless, the study in this thesis will be carried out by focusing on cross-productivity hypothesis due to the lack of data of employers' preference and suggested 'unobservables'.

In this thesis, empirical analyses are divided into two parts. The first part attempts to examine marriage effects on earnings, where the marriage effects are hypothesized to come from cross-productivity effects. The existence of cross-productivity effects is then tested, and comparisons of cross-productivity effects are

presented. The second empirical part analyzes expected wage effects on age at marriage, duration of marriage effects on earnings, and marriage effect on wives' labor supply. I use micro data of Hong Kong for the first part, and micro data of Taiwan for the second part study due to the lack of variables in Hong Kong data.

The organization of this thesis is as follows: the next chapter is a brief review of the existing literature on marriage pay differentials and age at marriage theories. Various hypotheses of theories are grouped and discussed in the literature review. Chapter III presents the overall estimation results and analyses of marriage differentials in Hong Kong. Chapter IV addresses issues regarding the age at marriage and the wage rate in Taiwan. The determinants of age at marriage are analyzed and, the wives' labor supply function is estimated by focusing on the marriage variables (e.g. husband's wage, presence of young children, dowry). Concluding remarks follow in Chapter V.

CHAPTER II

LITERATURE REVIEW

2.1 Marriage Pay Differentials

It is an established finding in the literature of wage determination and cross-sectional income studies that married men earn substantially more than those who are not currently married. Most literature refers this difference as the marriage pay premium. It appears that marriage pay premium is not as significant for women as for men. It is more difficult to test the marriage-earnings relationship among women because women tend to specialize more in home production. Therefore, a more ambiguous relationship between marriage and women's earnings is found. In this section, a brief review of studies of the marriage pay premium is presented.

In the past decades, numerous studies have tried to explain the sources of the marriage pay premium on earnings. Broadly speaking, we can classify them into three hypotheses. One major hypothesis is that earnings differentials come from productivity differentials. In other words, marriage, for various reasons, makes workers more productive (Becker 1973, 1981, 1985; Benham 1974; Greenhalgh 1980; Kenny 1983; Wong 1986). Another hypothesis argues that the premium is due to employer favoritism (Hill 1979; Korenman and Neumark 1991). A

third explanation claims that it is the unobserved characteristics affecting both wages and marital status that cause an association between marital status and wages in cross-sectional studies (Cohen and Haberfeld 1991; Nakosteen and Zimmer 1987; Gwartney and Stroup 1973). These three hypotheses will be discussed in turn as follows.

Among these hypotheses, the most prevalent class of explanation seems to be the productivity hypothesis. It claims that married men are paid more in response to an actual productivity increase caused by the change in marital status (from an unmarried to a married man). In explaining the actual productivity increase, economists have various ideas. One of these is the specialization argument. Economists argue that productivity is raised as marriage facilitates specialization in labor market production and household production.(Becker 1973, 1981, 1985). In Becker's studies, it is shown that marriage lets the high wage spouse (most likely the husband) spend more time on making money, and the low wage spouse (most likely the wife) specialize in doing household production. The total production is then raised by specialization. Moreover, Becker also finds that the gains from marriage are greater for high wage males than for low wage males.

Greenhalgh (1980) conducts a similar research and tries to explain the wage differentials in terms of

market discrimination and family role specialization using the data from the General Household Surveys of 1971 and 1975 in Great Britain. Greenhalgh compares the average earnings of different groups and attributes the residual (unexplained differential) to either discrimination or family role specialization. From the data in Great Britain, it is found that the differential between single and married women due to family role specialization is 12%, and is 10% for men.

Another explanation of the increase in productivity is the cross-productivity effect. According to this argument, wives are believed to improve household's decision making process, motivate men to work, and provide emotional support to men. Especially, Benham (1974) suggests that an individual's earnings (E_o) reflects one's own labor market productivity, whereas labor market productivity is a function of the effective human capital stock, H of that person. H depends on the individual's own human capital stock, H_o and his/her spouse's human capital stock, H_s. More explicitly,

$$(2.1) \qquad E_o = f(H) = g(H_o, H_s),$$
$$\text{where } \partial E_o / \partial H_o > 0 \text{ and } \partial E_o / \partial H_s > 0.$$

It is assumed that the effective human capital stock of a married person is a positive function of the human capital of the marriage partner and this is the so-called cross-productivity effect. Benham believes that the

positive cross-productivity effect is caused by the transfer of the benefits of education by the spouse. He explains that these benefits may arise in three ways:

a) by extending advice and information, thereby providing a close substitute for a person's own education;

b) by helping one to acquire specific skills; and,

c) by helping one to acquire general skills related to information acquisition and assimilation.

Therefore, productivity is enhanced as benefits of education is transferred within marriage.

Moreover, Wong (1986) makes use of the 1976 By-Census Hong Kong Population data and finds that the cross-productivity effects are stronger in entrepreneurial families than otherwise. He suggests that having similar marketable skills, greater mutual interest, lower transaction cost and communication cost in the entrepreneurial families are the plausible reasons for higher cross-productivity effect. As a result, couples who share job-related skills and information can benefit more from each other's human capital, and in turn enhance each other's productivity substantially.

Apart from the specialization argument and the cross-productivity effect hypothesis, Kenny (1983, pp.224-225) thinks that married men can accumulate human capital more rapidly because investment cost of human capital decreases after marriage. The reason for low

investment cost he offered is: "A man is able to borrow at lower cost from a wife than from other sources to finance investment in human capital; this is partly because alimony reduces the risk faced by wives when they finance their husbands' investment in human capital". Besides, he finds that married men work longer hours than unmarried men. As a result, a given level of annual investment in training consequently will be cheaper to married men who work more hours than unmarried men. This can also explain why married men's average investment cost is lower. Since males can accumulate human capital more rapidly when they are married, their productivity will increase accordingly.

The second class of explanation for pay differentials is the employer favoritism hypothesis. It has been argued that marriage and labor participation are complementary for men but competitive for women. Korenman and Neumark (1991) use data on job grades and supervisor performance ratings from a company personnel file and find that the pay differentials are highly associated with the performance ratings. It is noted that married workers tend to be placed in higher paying job grades, receive higher performance ratings than single men, and thus are more likely to be promoted. These observations can be partly explained by the fact that employers may find that married men have greater financial responsibility and, tend to be more stable and responsible, whereas married women are perceived to have

higher turnover rate and more absenteeism. It is also possible for the employers to discriminate against unmarried men who are perceived to be in lesser financial need than their married counterparts.

Hill (1979) investigates the validity of using marital status and children variables as proxies for individual differences in labor force attachment, work history, and training. He finds that the number of children rather than marital status is a good proxy variable for differential work history and labor market attachment. In addition, the number of children one bears indicates one's financial responsibilities to the family. Hill also finds that workers have greater financial responsibilities receive higher wages after numerous aspects of worker qualifications are controlled.

On the other hand, some economists such as Cohen, Haberfeld, Nakosteen and Zimmer argue that the cross-sectional effects of marital status on wages in fact do not exist. They attribute the pay differentials either to unobserved characteristics which affect both wages and marital status or to the wrong methodology employed in modeling.

Cohen and Haberfeld (1991) claim that it is the omitted variables or unobserved characteristics rather than the marital status cause the pay differentials. The reason for the observed cross-sectional association

between marital status and wages is the omitted variables affecting both wages and marital status. The cross-sectional effects disappear when a model using longitudinal data is used. They suggest that the unobserved characteristics are the variables affect the success of men in bureaucracies. They speculate those variables are physical features, social structure, men's positions within social networks, social relationships, conformity to social expectations, and so on. They find that above variables may affect both wages and the propensity to be married, and these variables are the variables that cause the pay differentials.

Likewise, Nakosteen and Zimmer (1987) find that there is a possibility that marital status is determined stochastically by a process whose random unobservable component is correlated with unobservables in the wage function. Therefore they estimate a model of earnings equation which permits endogenous selection of marital status. It is found that marital status fails to emerge as a source of enhanced earnings in the endogenous model.

Moreover, Gwartney and Stroup (1973, p.585) find that "Males who remain single might do so because most females accurately perceive that they will be unlikely to attain economic success." It is believed that high income men are more attractive in marriage markets and have higher propensity to get married. That is, economic success affects the propensity to get married in other

way around. This idea gives a new angle to look into the relation between marriage and earnings. Other economists also build their theories of age at marriage and wage along this line of thinking. In the next section, I will give a more detailed review of the research of this stream.

2.2 Age at Marriage and Earnings

In the literature of age at marriage theories, there is again no agreement on the relation between age at marriage and earnings. Economists dispute over age at which high-wage males enter into the marriage markets. The controversies arise from two opposite standpoints. One asserts that high-wage males get married at early age and thus there is a negative relation between age at first marriage and income. Another claims that there should be a positive relation between age at first marriage and income, that is, high-wage males marry later.

Becker (1973,1974) argues that high-wage males marry earlier rather than later because high-wage males tend to gain more from marriage than low-wage males through enjoying greater returns to specialization by marrying low-wage females who specialize in doing household production. As there is more to be benefited from being

married, high-wage males spend less time on searching marriage partners and hence marry earlier.

Similarly, Keeley (1977) finds that high wage males and low wage females are more likely to enter the marriage markets at early age. The reason behind is that high wage males stand to gain more from specialization with low wage women within household. He regresses age-at-first-marriage on wage, age and years of education and finds a negative coefficient of the wage rate for men.

Keeley (1979) presents a more in-depth analysis of the determinants of the age pattern of first marriage using data from the states in the U.S.. The theory is based on his work in 1977. He finds that variation in the parameters of the distribution of first marriage can be explained by variation in socio-economic variables that affect the gain from marriage and the cost of search. The gain from marriage and cost of search are two critical factors that determine age at entry into marriage markets and the duration of search, which in turn determine the age at marriage. Those socio-economic variables are found to be relative wages, sex ratio, education, population density, standard deviation of education and wages, race, divorce laws and fraction of men in the military.

However, Bergstrom and Bagnoli (1993) have opposite opinion. They argue that high wage men tend to marry

later. Noticing a universal phenomenon that mean age at marriage of males exceeded that of females, they model the difference in age at marriage of males and females based on the different economic roles between the sexes and the corresponding difference in the rate at which evidence of one's quality as a possible marriage partner is revealed. Men's role is perceived to be economic providers, and their economic capabilities are revealed only after they have spent time in the work force. Females' anticipated tasks are child-bearing and child-rearing, and their capabilities for these tasks are revealed once they reach physical maturity. Due to such differences, males who expect success find beneficial to get married until their economic capabilities are revealed. They tend to wait and marry at later age with more desirable females; males with poor prospects marry at an early age, whereas all females marry relatively early in life.

Vella and Collins (1990) suggest that the average age differences between marriage partners is due to the preference of young and rich marriage partners. Moreover, individuals may find that they can gain wealth by postponing marriage and investing in human capital. Since males are more likely to succeed in market work than females, the gains from postponing marriage and investing in human capital are larger for them, and that is why males are likely to marry at older ages.

Bergstrom and Schoeni (1992) further investigate the relationship between age-at-first-marriage and the own wage of men by employing data from 1980 U.S. Census. They find a positive relation between age-at-first marriage and own wages of men but a much weaker relation for women.

Facing these two opposite standpoints, Zhang (1995) tries to disentangle these seemingly mutually exclusive theories. He finds that both the Becker and Bergstrom-Bagnoli hypotheses can hold in the sense that one hypothesis is more applicable to a particular group of men than the other. Using micro data from Taiwan, he separately analyzes the men with working wives and non-working wives. He hypothesizes that the Becker specialization effect dominates for men with non-working wives and, the Bergstrom-Bagnoli revelation effect dominates for men with working wives. The result supports the hypothesis he placed and it sheds new light on the research of the wage-marriage age relation.

A brief review of part of the multitude studies gives us some general ideas about the findings in the literature of marriage and earnings. Various hypotheses and explanations offered by the economists let us have more in-depth understanding of the phenomenon from different angles. In fact, the theories themselves are not compelling to each other. Each theory offers partial explanations for the questions. We should not rashly

conclude that one model is a full explanation of the phenomenon and neglect the others. In this thesis, empirical analyses of cross-productivity effect and the relationship between age at first marriage and the wage rate are presented using Hong Kong and Taiwan data respectively. It is hoped that research in this thesis will contribute to the continuing refinement of models of earnings determination.

CHAPTER III

MARRIAGE AND EARNINGS

In recent years, considerable effort has been made to analyze the determinants of individual wages and earnings. It has been found that married men earn substantially more per hour worked than men who are not currently married. The cross-sectional wage differentials persist when control variables such as education, race, age and work experience are introduced.

In this chapter, a complete empirical analysis is presented. Section 3.1 provides a simple analysis of marital status in Hong Kong. Section 3.2 analyzes the marriage effect on earnings. Section 3.3 investigates the existence of cross-productivity effect on earnings. Section 3.4 further examines whether the cross-productivity effect is higher in the families in which the couples working in the same industry. Section 3.5 studies the cross-productivity effect across managerial class and non-managerial class. Sections 3.6 and 3.7 repeat the analyses of section 3.4 and section 3.5 but focus on the families in which the couples working in the same field[1].

[1]Definition of 'same field' is stated in section 3.5.

3.1 A Simple Analysis of Marital Status in Hong Kong

The data used for analysis in this chapter are from the 1% sample of the 1991 Hong Kong Population Census conducted by the government of Hong Kong. From the descriptive statistics shown in Tables 3.1 and 3.2, we can see that 38% of male eligible population[2] and 30% of female eligible population are single. That means that more than a half of eligible population are 'ever married'[3]. Focusing on the working sample, there are 64% ever married males and 55% ever married females. A large portion (over 90%) of married individuals are currently married while the widowed or divorced cases are below 5%.

The mean years of schooling of single males are 11 years which is greater than that of the ever married males. The difference in years of schooling is mainly due to the implementation of nine years compulsory education by the government since the 1970's. Consequently, the older males (especially those aged above 30) have received fewer years of formal education than the younger ones.

From Table 3.2, we can see that the mean monthly earnings of single males (using the working sample) is HK$6606.7. Mean monthly earnings of currently married working males and divorced working males are about 1.5

[2]Eligible population refers to all working or non-working people aged 16 to 65 who are eligible to work.

[3] Ever married people include people who are currently married, widowed and divorced or separated.

times of the single working males. Widowed working males earn the least on average.

Moreover, it is noted that the mean age of the single males are much smaller than that of the ever married subgroups. Single males are aged 27 on the average, whereas the ever married males are over 40 on the average. Since married individuals are usually older than single counterparts, they thus have more working experience. Then, it is more difficult to separate the effect of working experience from marital status by comparing mean earnings of married and unmarried one. Therefore, we can only get a general impression of the earnings distribution from the descriptive statistics. To have a more serious study, we have to separate the effects of the variables (age, marital status, education etc.) resorting to econometric techniques. The later sections will focus on examining the marriage effect upon earnings while controlling the effect of other personal variables.

Before going into the core analysis of marriage and earnings analysis, this section provides a basic understanding of marital status determination in Hong Kong. A simple probit equation of marriage is estimated as follows:

(3.1) Currently Married = α + β1 age + β2 own education + β3 language + ε

where Currently Married = 1 if currently married
= 0 otherwise (i.e. single, widowed or divorced)

education = years of schooling

language = 1 if Cantonese is the mother language
= 0 otherwise

Detailed definitions of all variables used in this thesis are shown in Table 3.3. The 1% 1991 Hong Kong Census data are employed to estimate (3.1). The results presented in Table 3.4 show that education has different effects on probability of getting married for male and female. As commonly observed, highly educated males are more likely to get married, but highly educated females are less likely to get married. Age has a positive effect on probability of getting married. The estimate of the language coefficient is positive but not significant.

If one can benefit from his or her spouse's education and earn more as predicted by the cross-productivity hypothesis, then both of the highly educated males and females should be more likely to get married. As it is found that highly educated females are less likely to get married, such a result may contradict to the cross-productivity hypothesis. And it has to be

explained by theories other than cross-productivity hypothesis. Since our main concern is relationship between marriage and earnings, a more serious investigation of marital status determination is not taken here.

3.2 Regression Analysis for Marriage Effects on Earnings

3.2.1 Model Specification

To examine the factors leading to earnings differentials, an augmented version of the Mincer (1974) earnings function is employed. The regression is as follows:

$$
\begin{aligned}
(3.2) \qquad \log \text{Earnings} = {} & \beta_0 + \beta_1 \text{ experience} \\
& + \beta_2 \text{ experience}^2 \\
& + \beta_3 \text{ own education} \\
& + \beta_4 D_1 + \beta_5 D_2 \\
& + \beta_6 \text{ duration of residence in Hong Kong} + \beta_7 \text{ nationality} \\
& + \beta_8 \lambda + \epsilon
\end{aligned}
$$

where Earnings = the monthly earnings from the main employment of an individual

education = years of schooling

experience = age - years of schooling - 6

D_1 = 1 if married

= 0 otherwise

D_2 = 1 if widowed, divorced or separated

= 0 otherwise

duration of residence = 1 if greater than or equal to 7 years in Hong Kong (permanent residents)

= 0 otherwise

nationality = 1 if one's nationality is British or Chinese

= 0 otherwise

λ = inverse Mill's ratio (to be defined)

The above equation is estimated separately for men and women. Education level and experience are the personal characteristics other than marital status. The formulation of working experience (experience = age-years of schooling-6) is a conventional calculation of experience in labor economics.[4] On the other hand, duration of residence in Hong Kong and nationality in the specification are the dummy variables which capture the location-specific human capital differences or the labor market screening effects. Finally, ϵ is the random disturbance term.

[4]All formulations of working experience are only a proxy of actual working experience. Since women tend to specialize more in home production, such a proxy may over-estimate the working experience of women. We should take this into considerations when interpretation of the working experience effect of women is made.

The sample is censored in the sense that earnings of the non-working eligible population are observed to be zero. Direct estimation of the earnings functions without adjusting for the choice of work status will lead to biased estimates. Heckman's (1976) two-stage estimation method is commonly used in correcting the selectivity bias. The following is the procedures of this estimation method.

1. Estimate the probit equation of the probability of working by maximum likelihood.

$$
\begin{aligned}
(3.3) \qquad y_i^* = {} & b_0 + b_1 \text{education}_i \\
& + b_2\ \text{experience}_i + b_3\ \text{experience}^2{}_i \\
& + b_4\ \text{log other cash income}_i + b_5\ D_{1i} \\
& + b_6\ D_{2i} + b_7\ \text{Head of the Household}_i \\
& + b_8\ \text{log household income}_i \\
& + b_9\ \text{elderly person}_i + u_i
\end{aligned}
$$

where education is years of schooling;

other cash income is non-labor income;

D1 = 1 if married,

= 0 otherwise;

D2 = 1 if widowed, divorced or separated,

= 0 otherwise;

Head of the household = 1 if one is the household head,

= 0 otherwise;

Household income is the total income in the household;

Elderly person is 1 if there is (are) person(s) aged 60 or above in the household.

In matrix form, (3.3) can be written as

$$(3.4) \qquad y_i^* = b'x_i + u_i$$

What we observe in the data is whether individual i works ($y_i = 1$) or not ($y_i = 0$) and we use y_i^* in (3.3) as the "latent" variable for this dichotomous realization. y_i^* would be defined as "propensity or ability to find employment". Individual i works if $y_i^* > 0$; otherwise that means he does not work. In other words, it is a binary choice selectivity model as follows.

$$(3.5) \qquad Pi = Prob(y_i = 1) = Prob(u_i > -b'x_i)$$

If the errors u_i follow a normal distribution, we have the probit model.

$$(3.6) \qquad L = \prod_{yi=1} Pi \prod_{yi=0} (1 - Pi)$$

After estimating the probit equation (3.6) by maximum likelihood to obtain estimates of b, we can then compute estimate of inverse Mill's ratio λ by (3.7) for each observation in the selected sample.

$$(3.7) \qquad \hat{\lambda}i = \phi (b'\hat{x}_i) / \Phi (b'\hat{x}_i)$$

where ϕ (.) is the standard normal pdf, and Φ (.) is the standard normal cdf.

2. Include the inverse Mill's ratio as a regressor in the earning function (3.2). The resulting OLS estimates of the parameters of the earning functions will become consistent.[5]

3.2.2 Data

In the 1% sample data, the eligible population consists of 37898 persons whose age ranges from 16 to 65. Of the 37898 eligible populations, there are 19497 males and 18401 females. Samples of these observations are used to estimate the probit equation of work. In the sample of eligible population, 7556 males and 5577 females are never married; 11581 males and 11845 females are currently married; 161 males and 733 females are widowed; and 199 males and 246 females are divorced or separated. In addition, 83% of the 19497 male eligible population worked during the seven days before enumeration in the 1991 population census, and 54% of the 18401 female eligible population worked during the seven days before enumeration in the census. These working samples are used in the estimation of earnings functions.

[5]For details, see Heckman (1976, pp.475-492).

Means and standard deviations of the variables of the eligible population samples are reported in columns 1 and 3 of Table 3.5. The mean age for both men and women is 37. The mean log monthly earnings of men and women is 7.0 and 4.3 respectively. We can see that the monthly earnings difference between men and women is quite large. Since monthly earnings is determined by wage rate and number of hours worked and, it is speculated that most of the women do part-time job or do not work at all. The variation in working hours between men and women may be a plausible cause of the earnings difference. It may be further supported by the difference in the experience of working men and working women. It is seen that the mean years of experience is 30.06 years for men and 26.516 years for women. However since number of working hours and the wage rate are not reported in the Census, we cannot verify whether the main cause of the earnings gap is the wage rate difference or the working hours difference.

3.2.3 Empirical Results

Results of probit estimation are shown in Table 3.6. It is found that married men are more likely to work while married women are less likely to work. The result may due to the role specialization between husband and wife in a family. Moreover, it is shown that people

having elderly people at home, earning higher household income or being household head are more likely to work. Elderly people being dependents may impose a need for family to make more money. Besides, elderly people release housewife to go out to work by helping her to look after the young children. Therefore, presence of elderly people may raise one's probability of working. The total income of a household may indirectly reflect the conditions of labor market (e.g. easiness of job searching, mean wage rate). These conditions are positively related to the probability of working. Furthermore, people being household heads are usually the main wage earners in the families and thus have a higher probability to work.

Since no hourly wage is reported in the 1991 Hong Kong census, the dependent variable used in equation (3.2) is log monthly earnings. Monthly income is determined by hourly wage rate and number of working hours. Therefore log other cash income (non-labor income) may enter into equation (3.2) as a factor affecting the number of working hours. Two groups of estimates for equation (3.2) are reported in Table 3.7[6], one with log other cash income entered as an independent variable in equation (3.2), and the other without the other cash income variable.

[6]The regression results reported in this thesis have been adjusted for heteroscedasticity.

The robust finding that currently married men earn more than unmarried ones is replicated in this study. Both of the two groups of estimates (with or without log other cash income as independent variable) show that the currently married men earn 11% to 16% more than the unmarried counterparts. The marriage effect is positive and significant. In addition, the widowers or divorced men also earn 7% more than the unmarried ones. It appears that the marital status of 'currently married' and 'widowed or divorced' are positively associated with earnings.

Besides, the coefficient of log other cash income is positive and significant. It is expected that other cash income should have negative effect on working hours and thus have negative effect on monthly income. However, since other cash income is not remuneration for work (including interest, dividend, rental), "smart" people may master better investment strategies and receive more other cash income. In this way, other cash income may reflect one's unobserved productivity(e.g. talent), and this may be the reason for the positive estimate of log other cash income.

Moreover, the coefficients of the inverse Mill's ratios are statistically significant. This indicates the presence of sample censoring. The selection bias are corrected using Heckman's correction method.

For women, it appears that all of the estimates of the marriage dummies are positive and significant. The results of the two regressions (one with other cash income and the other without other cash income) are in parallel; they show that the currently married women earn much more than the widowed women, divorced women and single females. The widowed women and divorced women earn 32% to 38% more than the unmarried counterparts.

Here I find that both married men and women earn higher income than the unmarried counterparts. However, marital status itself cannot explain the pay differentials. It is because marital status is a status representing whether an individual has ever had a spouse or not. It is not the status but the 'properties' of the status that cause the pay differentials. Therefore, in order to better understand the pay differentials, we have to find out what properties of 'currently married' affect an individual's productivity.

There are various hypotheses in the literature suggesting different (but not mutually exclusive) marital variables[7] to be the determinants of the earnings difference. Since all hypotheses offer partial explanation to the problem, economists supporting one hypothesis may not necessarily mean that they refute the others. In this thesis, I try to follow the most

[7] Marital variables here refers to the variables associated with the marital status. For example, spouse's years of schooling, social attitudes towards married men, and so on.

prevalent class of explanation and hypothesize the marriage effect coming from the cross-productivity effect. This topic is investigated in section 3.3.

3.3 Regression Analysis for Cross-productivity Effects on Earnings

The discussion in this section follows one of the most prevalent classes of explanation for the marriage pay premium by focusing on the wives' effect. More specifically, this section examines whether it is spouse's human capital (using education as a proxy) that raises one's productivity and leads to pay differentials. This is the cross-productivity effect within a household.

In section 3.1, positive marriage pay premium is found to be associated with currently married men. Now, I will try to examine whether the marriage pay premium comes from the cross-productivity effect.

Recall equation (2.1) as follows,

(2.1) $E_O = f(H) = g(H_O, H_S)$,

where $\partial E_O / \partial H_O > 0$ and $\partial E_O / \partial H_S > 0$.

As stated in section 2.1, it is postulated that a person's own labor-market productivity depends on the one's own human capital stock, H_O and the spouse's human capital stock, H_S. In this section, I will take a step

further to study the cross-productivity effect. The variable "spouse's education" will be introduced into the earnings function and only the data of the married individuals who currently lived with their spouse at the survey date are employed.

3.3.1 Model Specification

The model employed in the study is as follows. The regressions are estimated for men and women separately.

$$\begin{aligned}(3.8)\quad \log \text{Earnings} = {} & \alpha_0 + \alpha_1 \text{education}_i \\ & + \alpha_2 \text{ experience}_i \\ & + \alpha_3 \text{ experience}^2_i \\ & + \alpha_4 \text{ spouse's education} \\ & + \alpha_5 \log \text{ other cash income}_i \\ & + \alpha_6 \text{ duration of residence in} \\ & \text{Hong Kong} + \alpha_7 \text{ nationality} \\ & + \alpha_8 \lambda + \eta_i\end{aligned}$$

where the spouse's education is the spouse's years of schooling.

Again, I use Heckman's (1976) two-stage estimation method to correct the selectivity bias in estimating equation (3.8). It is hypothesized that α_4 is positive, indicating that spouse's education may raise one's own productivity and lead to higher earnings.

3.3.2 Empirical Results

Probit estimation results of equation (3.8) are shown in Table 3.8. The results are similar to those of the full sample. It is found that people having higher education, earning more household income, being household head are more likely to work, whereas people with higher other cash income (non-labor income) are less likely to work.

The empirical results of equation (3.8) are reported in columns 3 and 6 of Table 3.7. Estimates of one's own education and spouse's education for married individuals are positive and statistically significant. Since earnings is reflected by productivity, that means an individual's productivity is improved by one's spouse's education as well as by one's own education. The estimates of spouse's education for husbands and wives are 0.0363 and 0.0316 respectively. It appears that husbands benefit more from the spouse's education than wives.

In the model specification, the nationality dummy is used to capture the labor market screening effects and location specific human capital differences. Since Hong Kong is a British colony, it is interesting to see whether British nationality or Chinese nationality has significant effect on earnings when comparing with other

nationalities. The estimate of nationality dummy is positive and significant for men but negative and insignificant for women. This seems to imply market screening effects or location specific human capital differences exist for men. Men with British nationality or Chinese nationality earn more.

The coefficients of the inverse Mill's ratio are statistically significant for married women but statistically insignificant for married men which indicating that there is presence of sample censoring for women only.

It is found that the coefficient of education does not change much when the variable 'spouse's education' in equation 3.8 is dropped. Such an estimation is carried out to see whether spouse's education has a net effect or not. The estimation results are presented in Table 3.7a.

In short, a significant cross-productivity effect on earnings is present in Hong Kong. In the next section, I will try to narrow our focus and further investigate whether couples have occupation in the same industry may have a higher cross-productivity effect.

3.4 Cross-productivity Effects upon Earnings for Couples Working in the Same Industry vs. Couples Working in Different Industries

It is intuitive that people can improve their skills and productivity by exchanging experience with other people who are performing similar jobs. And it leads one to wonder whether benefits from spouse's education are greater in the family where similar skills can be shared. Couples working in the same industry appear to have more chance to share similar skills or experience. Therefore, it is postulated that the cross-productivity effect in the families in which the couples working in the same industry is greater than that in the families in which the couples working in different industries.[8]

3.4.1 Data

To test the above hypothesis, only the working sample of the married men and women in the data of Hong Kong is used. There are 460 pairs of couples working in the same industry. In this group of people, the mean of log monthly earnings is 8.98 and 7.38 for men and women respectively (see columns 1 and 5 of Table 3.9). Besides, there are 1001 pairs of couples working in different industries. In this group of people, the mean of log monthly earnings is 8.91 and 8.83 for men and

[8] The endogeneity of industry or occupation selection is not taken into consideration in the analyses.

women respectively (see columns 2 and 6 of Table 3.9). It is found that other characteristics of these two groups of people are more or less the same. The mean of the own education for the two groups are about 10 years. The mean working experience are 24 years for men and 20 for women.

By the "same industry" I mean that one person has the same industry code with his/her spouse. The industry is categorized by the subdivision of 1) Manufacturing industry; 2) Construction; 3) Transport, storage and communication industry; 4) Financing, insurance, real estate and business services; 5) Community, social and personal services; 6) Others. "Couple work in the same industry" is characterized by "both husband and wife work in the same subdivision of the above major division". An example could be that both husband and wife work in the textiles industry which is the subdivision of the Manufacturing industry.

3.4.2 Model Specification

An interactive variable 'ind*spouse's education' is introduced in the earnings function to test whether the cross-productivity effect is greater in the families in which the couples working in the same industry. 'ind' is an industry dummy variable. Positive coefficient b_9 (see below) represents a greater cross-productivity

effect in the families in which the couples working in the same industry. In addition, 'sex' is the sex dummy used to identify the sex difference effect on earnings. The following regression applies for the whole married working sample.

(3.9) $$\log \text{Earnings} = a + b_1 \text{experience} + b_2 \text{experience}^2 + b_3 \text{own education} + b_4 \text{spouse education} + b_5 \text{duration of residence in Hong Kong} + b_6 \text{nationality} + b_7 \log \text{other cash income} + b_8 \text{sex} + b_9 \text{ind*spouse's education} + \upsilon$$

where sex = 1 if male
= 0 otherwise
ind = 1 if work in the same industry as one's spouse (with the same industry code)
= 0 otherwise

3.4.3 Empirical Results

The results are reported in column 1 of Table 3.10. The coefficient of sex dummy is positive indicating that there is a sex premium for male over female on earnings.

However, we should not rashly interpret this as sex discrimination. Since there may be a productivity difference between male and female, the earnings difference between two sexes may due to productivity difference and sex discrimination. A more rigorous treatment is to separate these two effects. However, as our focus in this thesis is not on sex discrimination, the result reported here only gives a general idea of sex effect on earnings.

Notice that spouse's education has positive effect on earnings. And the core result is that the cross-productivity effect of couples working in different industries is 0.0307, whereas the cross-productivity effect of couples working in the same industry is ∂Earnings/∂spouse's education = 0.0307 + 0.0077*ind = 0.0384. This implies "working in the same industry" increases the cross-productivity effect and is consistent with our hypothesis stated at the beginning of this section.

Furthermore, ∂Earnings/∂Industry Dummy = 0.0077* spouse's education. That means that the knowledge and skills are shared more efficiently between the more educated couples.

3.5 Further Analysis of Couples Working in the Same Industry: Cross-Productivity Effects on Earnings for Managerial Class Couples vs. Non-managerial Class Couples

It is noted that some types of skills are more difficult and takes more time to go through the stages of teaching, learning, practicing and mastering. An example would be craft and art skills. Therefore, these type of skills are more difficult to be shared or generalized. Some types of skills (e.g. clerical skills) are easier to be generalized. The easiness of generalization may affect the efficiency of skills sharing in a family. And it is suspected that the easiness of skills generalization varies across broad occupational categories due to the distinct characteristics of the occupational nature.[9] Therefore, cross-productivity effects may differ across occupational categories.

It has been shown in section 3.4 that the cross-productivity effects are larger among the families in which the couples work in the same industry. This section attempts to investigate whether the cross-productivity effects differ within this type of families (in which the couples work in the same industry) due to

[9]Neuman and Ziderman (1992) have a research on this topic. They study the cross-productivity effects in different labor market contexts. They find that positive cross-productivity effects of wife's education on husband's earnings are present in the primary labor market sector but not in the secondary labor market sector.

different occupation categories they choose (managerial class vs. non-managerial class).

The classification of the occupation in the census follows the major groups and the sub-major groups of the International Standard Classification of Occupations[10] with local adaptation in Hong Kong. In this thesis, I classify the occupations under the major division of 'Managers and administrators', 'Professionals', and 'Associate professionals' as managerial occupations; the occupations under the major division of 'Clerks', 'Service workers and shop sales workers', 'Craft and related workers', 'Plant and machine operators and assemblers' and 'Elementary occupations' as non-managerial occupations.

3.5.1 Data

The sample used is the individuals who work in the same industry as that of their spouses. There are 460 pairs of couples in the sample. Of the 460 pairs of couples, 171 pairs of couples are such that both husband and wife are working in the managerial class, 289 pairs are such that either husband or wife or both are working in the non-managerial class.

[10]The outline of classification is stated in the manual of the 1991 1% Hong Kong Census.

3.5.2 Model Specification

To test whether the cross-productivity effects are greater in the families in which the couples working in the managerial class, an interactive variable ``mgr*spouse's education'' is put in the equation, where mgr equals one if both husbands and wives are in the managerial class. Positive coefficient b_9 may mean a greater cross-productivity effects in the families in which the couples working in the managerial class. Again, 'sex' is the sex dummy used to identify the sex difference effects on earnings.

(3.10) log Earnings = a + b_1 experience
+ b_2 experience^2
+ b_3 own education
+ b_4 spouse's education
+ $b_5$duration of
residence in Hong Kong
+ b_6 nationality
+ b_7 log other cash income
+ b_8 sex + b_9 mgr*spouse's
education + υ

where sex = 1 if male
= 0 otherwise
mgr = 1 if both husband and wife are
in managerial class
= 0 otherwise

3.5.3 Empirical Results

The results of estimation are reported in column 2 of Table 3.10. The spouse's education effect is positive for either managerial class or non-managerial class. It is noted that ∂Earnings/∂spouse's education = 0.0071 + 0.0465*mgr. There are greater cross-productivity effects for the couples working in managerial class. If the reasoning stated in the beginning of this section is correct, then the results may imply that managerial skills are easier to be shared and generalized than non-managerial skills. Another reason for the greater cross-productivity effects for managerial class families may be that sharing of managerial skills generates higher productivity. It can be seen that managers have higher earnings because greater productivity is generated by their managerial skills. The second explanation appears to be more plausible. It is because sharing or acquiring managerial skills may not seem as easier as sharing of non-managerial skills, but it may raise one's value of productivity in greater magnitude once the skills are shared.

Notice that there is positive premium for the permanent residents (0.2429). It is believed that permanent residents (duration of residence greater than 7 years) may have more location specific knowledge of Hong

Kong than the non-permanent residents. The positive estimate for the duration of residence implies either the presence of both location specific human capital differences or market screening effects.

3.6 Cross-productivity Effects upon Earnings for Couples Working in the Same Field vs. Couples Working in Different Fields

In the section 3.4, I confine samples to couples working in the same industry and couples working in different industries. Now I turn to analyze the couples who work in the same field or otherwise. For the "same field", I mean that both of the husband and wife work in the field classified by the major division of industry. For example, couples working in two different industries, say, textiles industry and paper products industry would be classified as working in the "same field". It is because both of them are working in the field under the major division of 'Manufacturing'. Thus, "same industry" is a subset of "same field".

3.6.1 Data

The sample used is the married working sample of the 1% 1991 Hong Kong Census data. There are 606 pairs of

couples working in the same field and 855 pairs of couples working in different fields.

3.6.2 Model Specification

Same model of equation (3.9) is used in this study except that a field dummy variable 'fld' is used to identify whether one is working in the same field as that of the spouse.

$$
\begin{aligned}
(3.11)\quad \log \text{Earnings} = {} & a + b_1 \text{ experience} \\
& + b_2 \text{ experience}^2 \\
& + b_3 \text{ own education} \\
& + b_4 \text{ spouse education} \\
& + b_5 \text{ duration of residence in Hong Kong} + b_6 \text{ nationality} \\
& + b_7 \text{ log other cash income} \\
& + b_8 \text{ sex} + b_9 \text{ fld*spouse's education} + \upsilon
\end{aligned}
$$

where sex = 1 if male
= 0 otherwise
fld = 1 if work in the "same field" as that of one's spouse
= 0 otherwise

3.6.3 Empirical Results

The empirical results are reported in column 3 of Table 3.10. Findings obtained in this section are similar to those in section 3.4.4. For the couples working in 'different fields', the cross-productivity effect is equal to 0.0302. This means that spouse's education has positive effect on earnings. And, for the couples working in the 'same field', ∂Earnings/∂spouse's education = 0.0302 + 0.0073*fld = 0.0375, implying "working in the same field" increases the cross productivity effects. However, cross-productivity effects are larger for the couples working in the 'same industry' than for the couples working in the 'same field' (0.0384 > 0.0375). It is consistent with the ideas that benefits from sharing similar skills and information are greater when the job contents of the couples are closer.

3.7 Further Analysis of Couples Working in the Same Field: Cross-Productivity Effects on Earnings for Managerial Class Couples vs. Non-managerial Class Couples

In section 3.5, I have already discussed that the cross-productivity effects differ among families in which couples work in the 'same industry' but with different occupation categories. It was found that the cross-productivity effects are larger among the families in which the couples are both in managerial class than that

of the families in which either husband or wife is in non-managerial class. Now, I repeat the exercise of section 3.5 and examine whether the cross-productivity effects among families in which couples working in the 'same field' are different due to different occupations they choose.

3.7.1 Data

The sample used are the individuals who work in the same field as that of their spouses. There are 606 pairs of couples in the sample. Of the 606 pairs of couples, 201 pairs of couples are such that both husband and wife are working in the managerial class, and 405 pairs are such that either husband or wife is working in the non-managerial class.

3.7.2 Model Specification

The model used in this study is the same as the one used in section 3.5.2, except that the sample used here is the married couples working in the same field instead of working in the same industry. The occupation dummy 'mgr' denotes whether the couples are in managerial class.

(3.9) log Earnings = a + b_1 experience
+ b_2 experience^2
+ b_3 own education
+ b_4 spouse's education
+ b_5 duration of residence in Hong Kong + b_6 nationality
+b_7 log other cash income
+b_8 sex +b_9 mgr*spouse's education + υ

where mgr = 1 if both husband and wife are in the managerial class
= 0 otherwise

3.7.3 Empirical Results

The results are reported in column 4 of Table 3.10. Cross-productivity effects are higher in the families in which both husband and wife are in managerial class than the families in which either husband or wife or both are in non-managerial class. For the non-managerial class, the cross-productivity effect is 0.0038 when the couples work in the same field, whereas cross-productivity effect is 0.0071 when the couples work in the same industry. The cross-productivity effects are larger for the managerial couples working in the same industry (0.0536) than those working in the same field (0.0493).

In short, there are three main findings concerning the cross-productivity effect. The first finding is that managerial families benefit more from sharing the similar skills and knowledge than non-managerial families. The reason for this finding may be that the managerial skills are more difficult to acquire comparing with the low level skills used in the non-managerial class. Besides, good managerial skills may raise the productivity of the inputs, therefore the return to such skills is higher. The second finding is that the efficiency of sharing information and skills are improved when the couple's job contents get closer and thus it leads to a greater benefits from the cross-productivity effects. The third finding is that couples working in the same industry benefit more from the cross-productivity effects, no matter they are working in managerial class or in non-managerial class.

In this chapter, the productivity hypothesis of the marriage effect on earnings is tested. The variable of spouse's education is put into the earnings function besides one's own education. After incorporating the variable of spouse's education into the model, the estimate of own education is still significant. Moreover, it is found that the coefficient of spouse's education is as significant as one's education in most of the cases.

The above findings are consistent with those of other related literature (Wong 1986, Neuman and Ziderman 1992). In these studies, a similar model specification is employed but using different sample of data. That means cross-productivity effect is proved to be significant for various countries using different samples of data from different countries. This may indicate that the positive cross-productivity effect is widespread and, the wage and marriage relationship is similar across countries.

However, someone may argue that the so-called cross-productivity effect is only a signalling effect. The argument is that the premium associated with spouse's education indicates an individual to be ``smart'' and thus have a educated wife. That means, the premium is not due to productivity caused by wife's education but one's own productivity signalled by wife's education. And, it is because some variables indicating an individual's own productivity are missing and the effect is captured by spouse's education. Therefore, to verify the cross-productivity hypothesis, I have to examine whether there is a productivity increase after marriage. I will complete the analysis in chapter V by incorporating the variable of 'duration of marriage' to examine the cross-productivity effect.

CHAPTER IV

WAGE AND AGE AT MARRIAGE

4.1 Regression Analysis of Wage Effect on Age at Marriage

Labor economists find that married men tend to earn more than unmarried men. There is another closely related but separate literature on the examination of the relationship between expected earnings and the age at marriage. It examines how earning potential affects the age at marriage and explains the age difference of marriage for males and females.

It has been observed that in most times and places, women on average marry older men. Bagnoli and Bergstrom (1993) suggest that the age difference at marriage between males and females is a result of the different economic roles of males and females. The economic role for males is money-making, and male's economic capabilities may be revealed only gradually after he has spent time in the work force. In contrast, female's anticipated tasks will be childbearing, so once she has reached physical maturity, the passage of time adds little information about her capabilities for these tasks. Bagnoli-Bergstrom's model predicts that males who expect to have lower earnings in later life will get married at younger ages, but those who expect to have more earnings in later life will get married at older

ages. In this section, I will examine the relationship between the earnings in later life and age at marriage[11].

4.1.1 Model Specification

To test the theoretical relationship between age at marriage and wage in later life for males and females proposed by Bagnoli and Bergstrom (1991), the following equation will be estimated for both males and females:

$$(4.1) \quad \text{Age at Marriage} = \alpha + \beta_1 \log \text{hourly wage rate} + \beta_2 \text{ age} + \beta_3 \text{ education} + \upsilon$$

The formulation of the equation is mainly based on the model proposed by Bergstrom and Schoeni (1992). The actual wage rate is used as one's expected earnings prospects as in Bergstrom and Schoeni (1992) and Zhang (1995).

4.1.2 Data

This study uses a set of extracted data from a 1989 island-wide family survey of Taiwan women aged 25 to 59. There are 2167 observations in the data set. The sample used in this section is called working sample I; the

[11]The theory assumes that high earnings in later life positively correlates with the earnings in young life.

means and standard deviations of the variables used in the model are reported in columns 1 and 3 of Table 4.1. After extracting the working sample and deleting the observations with missing variables, there are 1530 currently married men and 1117 currently married women in the sample. Since I am going to examine the relationship between age at marriage and wage in later life, I confine my attention to currently married individuals who are 40 years old or older[12] in the working sample I. There are 808 husbands and 439 wives who are 40 years old or above in working sample I. As the number of working hours is reported in the survey, the variable log wage rate is used in the study. The average log hourly wage rate is 4.4793 for husbands and 3.8466 for wives. The mean age is 48.609 for husbands and 46.164 for wives.

4.1.3 Empirical Results

The results are reported in Table 4.2. The estimate of the log hourly wage rate for men is positive and significant, implying that the more able is an individual to make money, the later will the individual get married. This result conforms with the ideas of Bagnoli and Bergstrom that males with poor prospects marry at an early age and those who expect success will marry later in life.

[12]The selection of age group follows Bergstrom and Schoeni (1992)'s study of income prospects and age at marriage.

On the other hand, it is found that the coefficient of the log hourly wage rate for women is insignificant though positive. Explanation offered by Bagnoli and Bergstrom (1992) is that females are expected to be less involved in market work than males, therefore it is less likely for their earnings in later life to be related to the desirability as marriage partners. Thus, a weaker relation between wage earnings and age at marriage for females than for males is expected.

4.2 Regression Analysis of Marriage Duration Effects on Wage Rate

In the theory of wives' effects on earnings, it is suggested that marriage raises the income of males and also the growth rate of earnings, that is, the longer is the duration of marriage, the more cross-productivity gains can the couple benefit. However, as I have mentioned in the previous chapter that there is also a concern that marital status exerts only a signalling effect rather than a productive effect. It is thus important to see whether marriage really reflects "omitted ability" or human capital accumulation during marriage. In order to differentiate these two hypotheses, a variable of marriage duration is introduced into the earnings function estimation. A significant

marriage duration effect may lend support to human capital accumulation hypothesis and refute the signalling hypothesis. Since the study of marriage duration effect on earnings is not possible for Hong Kong due to the lack of data on "marriage duration". I resort to the Taiwan data to do the estimation.

4.2.1 Model Specification

The following model is used to examine the above theory. As mentioned above, a probit equation is used to correct the selection bias.

$$(4.2) \quad y_i^* = b_0 + b_1 \text{ experience}_i + b_2 \text{ experience}_i^2 + b_3 \text{ own education}_i + b_4 \text{ educm}_i + b_5 \text{ richg}_i + b_6 \text{ preschool children}_i + U_i$$

where educm denotes mother's years of schooling

richg = 1 if one's father-in-law is rich

= 0 otherwise

preschool children = 1 if one's youngest child is less than age 6

= 0 otherwise

An earnings function (4.3) is then estimated using the inverse Mill's ratio derived from probit equation (4.2) to correct the selection bias.

(4.3) log hourly wage rate = $a + b_1$ own education
$+ b_2$ spouse education
$+ b_3$ experience
$+ b_4$ experience^2
$+ b_5$duration of
marriage* spouse's
education $+ b_6 \lambda + \varepsilon$

4.2.2 Data

The sample size of eligible population is 1537 and 1216 for men and women respectively after the observations with missing values are deleted. The eligible population sample is used for probit equation estimation. There are 1525 men and 1111 women worked in the market in the survey month. These are the working sample II. Labor participation for men is higher than 99%, so it does not seem necessary to correct selection bias for men. The means and standard deviations are reported in columns 2, 4 and 5 of Table 4.1.

4.2.3 Empirical Results

In the probit estimation, it is found that wives with higher education are more likely to work. Probability of the a randomly selected woman to work is higher if her mother's education is higher, but lower if

her father-in-law's wealth is higher. Wives with children under 6 years old is less likely to work as expected (see Table 4.3).

The findings of wage function estimation are reported in Table 4.3. It is noted that the estimated coefficients of spouse's education are positive and significant for both husbands and wives, whereas the estimates of the interactive variable spouse's education*duration of marriage are positive but insignificant.

All in all, though both spouse's education and own education are found to have positive and significant effect on one's wage, the marriage duration effect is found to be insignificant. The results do not lend support to the hypothesis of human capital accumulation during marriage.

4.3 Regression Analysis of Marriage Effect on Wives' Labor Supply

There is a close linkage between labor supply, earnings, and marital factors. Earnings and marital factors are the main determinants of labor supply especially for married women. Marital factors such as value of dowry, husband's wage, presence of young children affect the labor supply of married women in

household production and market production. It is postulated that value of dowry and husband's wage have positive income effect and so they lead to a reduction of labor supply[13]. Presence of young children also reduces wives' labor supply as mothers have to spend more time to look after children.

4.3.1 Model Specification

The model used to study wives' labor supply is as follows.

$$\begin{aligned}(4.4)\quad \text{Weekly hours of work} = {} & \alpha + \gamma_1 \text{ predicted log wage} \\ & + \gamma_2 \text{ log dowry} + \gamma_3 \text{ age} \\ & + \gamma_4 \text{ age}^2 + \gamma_5 \text{ preschool} \\ & \text{children} + \gamma_6 \text{ husband's} \\ & \text{monthly earnings} + \gamma_7 \lambda + \upsilon\end{aligned}$$

where λ is inverse Mill's ratio (computed from equation 4.2)

predicted log wage is the expected wage in earnings function (computed from equation 4.3)

log dowry is log of real value of dowry

preschool children = 1 if individual's youngest children is less than age 6

[13] Labor supply refers to the number of hours worked in the labor market. Here I confine the definition to be the number of weekly hours of work in the labor market.

= 0 otherwise

4.3.2 Empirical Results

The labor supply estimates of married women are reported in Table 4.4. We can see that the effect of log own wage is negative in labor supply function (4.4) which shows a backward-bending labor supply. The income effect dominates the substitution effect for women. That is, increase in wage rate leads to reduction of working hours.

Furthermore, in estimation of equation (4.4), the effect of husbands' earnings on wives' labor supply is negative. Since husbands' earnings can be treated as a proxy of wives' non-labor income, increase in non-labor income has a positive income effect, which reduces wives' labor supply.

It is noted that the presence of the children aged less than 6 exerts a negative effect on women's labor supply. It is very intuitive that mothers have to spend much more time to take care of younger children and thus their labor supply reduces accordingly.

Dowry effect on labor supply is negative but not significant. A plausible reason is that dowry value is not high enough and the income effect is too weak to be

picked up given the small sample size. We can see that the mean nominal dowry value is 89364 yuan (see Table 4.5) and, it is only about 7 times of the wives' mean monthly earnings (12878 yuan). Therefore, the income effect of receiving such amount of money after marriage may not be strong enough to affect the labor supply of wives.

All in all, the estimation of this chapter completes the analysis of cross-productivity effect. The overall results suggest that the cross-productivity is significant for men. Besides, the age of marriage of men is positively related to expected earnings. These results are consistent with those of the related studies. The analysis of cross-productivity by field, industry or occupation is a good contribution to the literature. One of the major findings in wives' labor supply function is that husband's wage and presence of young children also play great roles in determining wives' working hours besides her own wage. Dowry apparently has little effect on female's labor supply.

CHAPTER V

SUMMARY AND CONCLUSIONS

In this thesis I attempt to bring new evidence of marriage pay premium by studying Hong Kong and Taiwan data. There are eight principal findings.

First, it is found that both married men and women earn higher income than the unmarried counterparts. The currently married men earn 11% to 16% more and the widowers earn 7% more income than the unmarried ones. The currently married women earn 19% to 67% more than single females. On the other hand, the widowed women and divorced women earn 32% to 38% more than the unmarried counterparts.

Second, the estimates of one's own education and spouse's education for married individuals are positive and statistically significant. An individual's productivity is improved by one's spouse's education as well as by one's own education. This indicates the existence of cross-productivity effects.

Third, couples working in the same industry or in the same field as that of one's spouse enjoys higher cross-productivity effects. Moreover, cross-productivity effects are larger for the couples working in the same industry than for the couples working in the same field.

This result is consistent with the idea that benefits from sharing similar skills and information are more when the job contents of the spouse are closer.

Fourth, managerial families benefit more from sharing the similar skills and knowledge than non-managerial families. Both managerial and non-managerial couples working in the same industry benefit more from cross-productivity effects than those working in the same field.

Fifth, in the analysis of wage effect on age at marriage, the estimate of the log hourly wage rate for men is positive and significant, whereas the coefficient of the log hourly wage rate for women is insignificant though positive. The results conform with the idea of Bagnoli and Bergstrom. Males with poor prospects marry at an early age and those who expect to succeed will marry later in life. Females are expected to be less involved in market work than males. Therefore, a weaker relation between wage earnings and age at marriage for females than for males is expected.

Sixth, marriage duration effect is found to be insignificant.

Finally, it is found that husband's wage and presence of young children has negative effect on wives'

working hours. The dowry effect is small and insignificant.

In this thesis, the analysis mainly attempts to test the cross-productivity effect (one of the most prevalent classes of explanation for the marriage effect on earnings). This hypothesis only reveals part of the picture. Various hypotheses have to be combined in order to give a whole picture. Further research can be focused on combination of the different ideas of marriage-earnings relationship.

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Table 3.1: Means (Standard Deviation) of Variables

	Men					Women				
Variable	Single	Ever Married	Ever Married			Single	Ever Married	Ever Married		
-	-	-	Currently Married	Widowed	Divorced	-	-	Currently Married	Widowed	Divorced
Monthly Earnings	4718.4 (6132.7)	8661.1 (11797)	8745.7 (11865)	3875.7 (5592.7)	7534.3 (10527)	4203.5 (5396.9)	2559.0 (5324.3)	2611.0 (5420.4)	1305.9 (2996.4)	3754.3 (5503.2)
Log Monthly Earnings	6.1458 (3.9173)	7.6671 (3.1315)	7.7050 (3.1000)	5.3583 (4.1275)	7.2968 (3.3419)	6.0093 (3.9015)	3.5853 (4.1829)	3.6186 (4.1932)	2.5360 (3.7715)	5.1127 (4.1927)
Education	10.748 (3.2124)	8.8677 (4.0781)	8.9040 (4.0683)	6.6707 (4.1199)	8.5052 (4.1402)	11.392 (2.9909)	7.5950 (4.3948)	7.8211 (4.2963)	3.8712 (4.2336)	7.8074 (4.5830)
Log Other Cash Income	0.3980 (1.7223)	0.81133 (2.4828)	0.7905 (2.4570)	1.4664 (3.0713)	1.5172 (3.2134)	0.33946 (1.6007)	0.6392 (2.1812)	0.5474 (2.0334)	1.6457 (3.2171)	2.0658 (3.5713)
Duration of Residence	9.6734 (1.4773)	9.6817 (1.4870)	9.6785 (1.4926)	9.8354 (1.0397)	9.7448 (1.4660)	9.3053 (2.2369)	9.2684 (2.1991)	9.2351 (2.2460)	9.7808 (1.0855)	9.3443 (2.2102)
Experience	8.6554 (9.1220)	27.073 (11.749)	26.851 (11.676)	41.184 (8.3528)	28.724 (11.287)	6.9672 (7.9876)	25.585 (12.249)	24.602 (11.815)	40.852 (8.6836)	27.430 (11.474)
Experience^2	158.12 (332.42)	870.96 (682.73)	857.31 (675.75)	1765.4 (600.7)	951.80 (669.94)	112.33 (257.12)	804.63 (694.32)	744.84 (655.68)	1744.2 (622.34)	883.55 (685.65)
N	7556	11941	11581	161	199	5577	12824	11845	733	246

Notes: The sample used in the descriptive statistics calculation is sample of eligible population.

Table 3.2: Means (Standard Deviation) of Variables

	Men					Women				
Variable	Single	Ever Married	Ever Married			Single	Ever Married	Ever Married		
-	-	-	Currently Married	Widowed	Divorced	-	-	Currently Married	Widowed	Divorced
Monthly Earnings	6606.7 (6339.7)	10040 (12144)	10095 (12202)	6123.0 (5975.4)	9041.0 (10928)	5760.7 (5563.3)	5997.7 (6770.4)	6073.9 (6879.0)	4160.6 (4096.5)	6230.9 (5905.2)
Log Monthly Earnings	8.6057 (0.5614)	8.8875 (0.7211)	8.8939 (0.7198)	8.4662 (0.6634)	8.7561 (0.7466)	8.2359 (1.5878)	8.4049 (0.7109)	8.4170 (0.7113)	8.0841 (0.6575)	8.4863 (0.6569)
Education	10.623 (3.1843)	9.1874 (3.939)	9.2147 (3.9289)	6.9000 (4.0961)	8.9187 (4.0577)	11.350 (2.9857)	8.8933 (4.2851)	9.0726 (4.1816)	4.9476 (4.8174)	8.8571 (3.9914)
Log Other Cash Income	0.1924 (1.1740)	0.5080 (1.9900)	0.5011 (1.9791)	0.8204 (2.3645)	0.7410 (2.3525)	0.20796 (1.2502)	0.3300 (1.5564)	0.3041 (1.4953)	0.4207 (1.7437)	1.0807 (2.7134)
Duration of Residence	9.6763 (1.4928)	9.6857 (1.4617)	9.6819 (1.4678)	9.8350 (1.1807)	9.8323 (1.9056)	9.1794 (2.4347)	9.1016 (2.3774)	9.0833 (2.4003)	9.5388 (1.5188)	9.0581 (2.6093)
Experience	10.099 (8.2961)	25.507 (10.929)	25.342 (10.864)	38.880 (9.1655)	27.425 (10.670)	8.5634 (7.2516)	22.028 (10.937)	21.290 (10.534)	37.153 (9.3793)	23.925 (9.4963)
Experience^2	170.81 (309.12)	770.03 (611.01)	760.22 (604.85)	1594.8 (637.93)	865.26 (618.33)	125.90 (231.30)	604.86 (562.97)	564.22 (527.07)	1467.9 (650.76)	661.98 (533.41)
N	5975	10215	9955	100	160	4525	5446	5070	229	147

Notes: The sample used in the descriptive statistics calculation is the working sample.

Table 3.3: Definitions of Variables

Variable	Definition
Currently Married	Dummy of currently married is 1 if the status reported by respondents in the Census is married; otherwise, is 0.
Age	The number of complete years a person has passed since birth.
Education	Years of schooling
Language	1 if one's mother language is Cantonese; 0 otherwise.
Log Earnings	Log of monthly income from main employment
Experience	proxy of actual working experience: age-year of schooling-6 (for years of schooling ≥ 9) age-15 (for years of schooling < 9)
Log household income	Log of the total income of all persons who are in the household on the Census reference date.
Elderly person	1 if there is persons aged 60 or over found in the household on the Census reference date; 0 otherwise.
Head of the household	1 if the person is acknowledged by members of the household to be responsible for making major decisions affecting the household; 0 otherwise.
Marriage dummies : D1, D2	D1 is 1 if married; 0 otherwise. D2 is 1 if widowed or divorced or separated; 0 otherwise.
Duration of residence in Hong Kong	1 if greater than or equal to 7 years in Hong Kong (permanent residents); 0 otherwise.
Nationality	1 if nationality is British or Chinese; 0 otherwise.
λ	Inverse Mill's Ratio
Spouse's education	Years of schooling of one's spouse.
Other cash income	All cash which are not remuneration for work are included e.g. interest, dividend, rental, welfare payment, old age allowance etc.
Sex	1 if male; 0 otherwise.

Ind (Industry dummy) / Fld (Field dummy)	1 if husband and wife are working in the same industry / same field; 0 otherwise.
Mgr (Occupation dummy)	1 if husband and wife are working in managerial class; 0 otherwise.
Age at marriage	Age at first marriage.
Log hourly wage rate	Log of hourly wage rate.
Educm	Mother's years of schooling.
richg	1 if father-in-law is rich[14]; 0 otherwise.
Preschool children	1 if one's youngest child is less than age 6; 0 otherwise.
Duration of marriage	Years got married.
Weekly hours of work	Number of working hours per week.
Predicted log wage	Predicted log of hourly wage rate.
Log dowry	Log of real value of dowry.
Husband's Earnings	Husband's monthly earnings

[14]The definition of rich used in this thesis is same as the definition of 'very rich ' used in the 1989 Family Survey of Taiwan women.

Table 3.4: Probit Estimate of Marriage

Variable	Male	Female
Age	0.03022 (12.124)	0.05481 (22.752)
Education	0.01886 (2.3600)	-0.4880 (2.6632)
Language	0.10897 (1.1462)	0.12289 (1.6450)
Constant	-4.1333 (20.432)	-4.9888 (26.824)
N	19497	18401

Notes: Absolute value of t-statistics are in parentheses.

Table 3.5: Means (Standard Deviations) of Variables

	Men		Women	
Variable	Full sample	married sample	Full sample	married sample
Log Monthly Earnings	7.0489 (3.5486)	7.3378 (3.6942)	4.3100 (4.2486)	3.7940 (4.3239)
Education	9.5658 (3.8860)	9.7140 (4.4044)	8.7332 (4.3878)	8.4466 (4.5752)
Experience	19.963 (14.045)	30.060 (14.431)	19.948 (14.035)	26.516 (13.608)
$Experience^2$	595.78 (670.73)	1111.8 (969.40)	594.88 (676.23)	888.21 (842.02)
D1	0.6450 (0.4785)	-	0.4732 (0.4993)	-
D2	0.0168 (0.1287)	-	0.0402 (0.1965)	-
Log Household Income	9.4545 (0.7174)	9.3698 (0.7965)	9.6235 (0.7415)	9.3698 (0.7965)
Elderly person	0.2877 (0.4527)	0.3204 (0.4666)	0.3274 (0.4676)	0.3204 (0.4666)
Head of the Household	0.5877 (0.4932)	0.7895 (0.4077)	0.1504 (0.3575)	0.3814 (0.4858)
Log Other Cash Income	0.6525 (2.2279)	0.9623 (2.5632)	0.5499 (2.0294)	0.7838 (2.2920)
N	19497	3325	18401	3325

Notes: Full sample is sample of eligible population in the 1% 1991 Hong Kong Census data.

Married sample contains the currently married working observations who are living with his or her spouse.

Table 3.6: Probit Estimates of the Full Sample

Variable	Men	Women
Experience	0.1324 (38.714)	0.0797 (26.935)
Experience^2	0.0028 (38.714)	-0.0017 (32.691)
Education	0.1080 (9.0112)	0.0800 (8.9413)
D1	0.1851 (4.288)	-0.8703 (25.634)
D2	0.1939 (1.9355)	-0.4922 (8.2361)
Log Other Cash Income	-0.1488 (28.870)	-0.1016 (18.955)
Log Household Income	0.3486 (20.597)	0.2993 (21.588)
Elderly person	0.0942 (3.1911)	0.2574 (10.677)
Head of the Household	0.5030 (13.710)	0.2993 (21.588)
Constant	-2.7041 (16.107)	-2.5845 (19.223)
N (working)	16190	9971
N (non-working)	3307	8430
N	19497	18401

Notes: Absolute value of t-statistics are in parentheses.

Table 3.7: Estimates of Log Earnings Equations

	Men			Women		
Variable	Full sample	Full sample	Married sample	Full sample	Full sample	Married sample
Experience	0.0427 (15.06)	0.0070 (2.689)	0.0072 (2.273)	0.0374 (13.94)	0.0144 (5.408)	0.0119 (3.869)
Experience^2	-0.0009 (16.39)	-0.2085 x10^{-3} (4.134)	-0.2930 x10^{-3} (5.088)	-0.0008 (15.05)	-0.3544 x10^{-3} (6.404)	-0.1324 x10^{-3} (2.131)
Education	0.0050 (1.038)	0.0201 (4.256)	0.0485 (17.94)	0.0390 (6.255)	0.0193 (3.062)	0.0687 (23.11)
Spouse's Education	-	-	0.0363 (11.68)	-	-	0.0316 (12.10)
Log Other Cash Income	0.0919 (23.41)	-	0.0021 (0.6517)	0.1027 (19.71)	-	0.0052 (1.182)
D1	0.1088 (9.566)	0.1580 (13.64)	-	0.6714 (25.04)	0.4623 (17.71)	-
D2	0.0210 (0.590)	0.0723 (1.957)	-	0.3776 (11.14)	0.3152 (9.240)	-
Duration of Residence	0.0921 (2.915)	0.1067 (3.237)	-0.1883 (5.389)	0.2212 (10.53)	0.2480 (11.50)	-0.0014 (0.0474)
Nationality	0.4110 (9.971)	0.4696 (10.84)	0.3135 (3.688)	-0.3897 (15.33)	-0.3519 (11.49)	-0.0030 (0.0505)
Inverse Mill's Ratio	-1.8511 (33.49)	-1.1367 (23.87)	-0.0175 (1.020)	-1.4611 (30.99)	-0.9908 (21.50)	-0.2674 (2.337)
Constant	8.8779 (175.8)	8.4169 (167.60)	8.3287 (149.5)	8.5457 (167.4)	8.1805 (13.49)	7.7104 (143.7)
R^2	0.4321	0.3636	0.2400	0.4270	0.3895	0.2967
N	19497	19497	3325	18401	18401	3325

Notes: Absolute value of t-statistics are in parentheses.

Table 3.7a: Estimates of Log Earnings Equations of Married Sample

Variable	Men	Women
Experience	0.0029 (1.115)	0.01608 (4.037)
Experience^2	-0.1229 x10^{-3} (2.741)	-0.2143 x10^{-3} (4.496)
Education	0.0598 (21.84)	0.0822 (25.84)
Spouse's Education	-	-
Log Other Cash Income	0.0034 (1.011)	0.0063 (1.425)
Duration of Residence	0.1541 (8.162)	0.2515 (10.76)
Nationality	4.7889 (5.253)	0.0922 (1.383)
Inverse Mill's Ratio	-0.0166 (0.950)	-0.0465 (4.037)
Constant	8.3403 (150.5)	7.6903 (136.7)
R^2	0.2120	0.2729
N	3325	3325

Notes: Absolute value of t-statistics are in parentheses.

Table 3.8: Probit Estimates of the Married Sample

Variable	Men	Women
Experience	0.0059 (0.7046)	0.4387×10^{-3} (0.4949)
$Experience^2$	-0.9841×10^{-3} (8.0433)	-0.4310×10^{-3} (5.3111)
Education	0.0079 (1.5754)	0.0272 (7.1455)
Log Other Cash Income	-0.1311 (21.531)	-0.0568 (7.859)
Log Household Income	0.3287 (13.897)	0.2979 (16.836)
Elderly person	-0.1039 (2.0166)	0.1276 (3.8675)
Head of the Household	0.2686 (5.9494)	0.0972 (2.5188)
Constant	-0.9501 (3.801)	-2.8363 (16.682)
N (working)	11385	5516
N (non-working)	196	6329
N	11581	11845

Notes: Absolute value of t-statistics are in parentheses.

Table 3.9: Means (Standard Deviations) of Variables

	Men				Women			
Variable	same industry	different industries	managerial	non-managerial	same industry	different industries	managerial	non-managerial
Log Monthly Earnings	8.9849 (1.6122)	8.9107 (1.4832)	9.7412 (0.7164)	8.9081 (0.6725)	7.3848 (3.3380)	8.3844 (1.6328)	9.4254 (0.6915)	8.4638 (0.5615)
Education	10.822 (4.2834)	10.709 (3.7937)	13.325 (3.2068)	9.4014 (4.1606)	10.026 (4.2860)	10.032 (3.9539)	12.965 (3.1097)	8.8714 (3.8638)
Spouse's Education	10.026 (4.2860)	10.032 (3.9539)	12.965 (3.1097)	8.8714 (3.8638)	10.822 (4.2834)	10.709 (3.7937)	13.325 (3.2068)	9.4014 (4.1606)
Experience	24.513 (11.983)	23.396 (10.834)	21.094 (10.481)	26.173 (12.389)	20.300 (10.849)	19.859 (9.7033)	17.306 (8.6082)	22.456 (11.210)
Experience^2	744.17 (684.08)	664.61 (593.28)	554.11 (540.02)	837.99 (733.41)	571.14 (568.26)	488.44 (476.61)	373.07 (361.39)	629.44 (611.41)
Log Other Cash Income	1.0168 (2.6920)	0.6857 (2.2966)	1.6076 (3.2404)	0.6621 (2.2076)	0.7529 (2.3013)	0.4429 (1.8240)	1.2506 (2.8596)	0.2301 (1.2612)
N	460	1001	171	289	460	1001	171	289

Notes: Married sample is divided into sample of the same industry and sample of different industries.
Sample of the same industry contains observations who are working in the same industry with his or her spouse.
Sample of different industries contains observations who are working in the different industries with his or her spouse.
Sample of the same industry is divided into sample of managerial class and sample of non-managerial class.

Table 3.10: Estimates of Log Earnings Equations

Variable	Married Working Sample (Same Industry)	Sample of Couples Working in the Same Industry	Married Working Sample (Same Field)	Sample of Couples Working in the Same Field
Experience	0.4500×10^{-3} (0.1169)	0.00809 (1.433)	0.3312×10^{-3} (0.086)	0.0099 (1.558)
Experience^2	-0.5027×10^{-4} (0.768)	-0.2476×10^{-3} (2.525)	-0.4725×10^{-4} (0.722)	-0.2806×10^{-3} (2.536)
Education	0.0880 (17.34)	0.05573 (7.866)	0.0882 (17.39)	0.05057 (6.159)
Spouse's Education	0.0307 (6.559)	0.0071 (1.015)	0.0302 (6.401)	0.0038 (0.4646)
Sex	0.3917 (15.97)	0.3873 (10.55)	0.3919 (15.98)	0.3834 (9.093)
Ind*Spouse's Education	0.0077 (3.225)	-	-	-
Mgr*Spouse's Education	-	0.0465 (13.14)	-	0.0455 (11.27)
Fld*Spouse's Education	-	-	0.7321×10^{-2} (3.234)	-
Duration of Residence	0.1866 (2.976)	0.2429 (2.871)	0.1873 (2.994)	0.3049 (3.111)
Nationality	0.2007 (2.390)	0.0795 (0.7841)	0.19501 (2.333)	-0.3225 (0.2748)
Log Other Cash Income	0.04047 (5.864)	0.02005 (1.995)	0.0402 (5.840)	0.1316 (1.119)
Constant	7.2594 (75.84)	7.6600 (57.22)	7.2559 (75.84)	7.6997 (47.98)
R^2	0.4414	0.4922	0.4414	0.4682
N	2922	920	2922	1212

Notes: Absolute value of t-statistics are in parentheses.

Table 3.11: Means (Standard Deviations) of Variables

	Men				Women			
Variable	Same Field	Different fields	Managerial	Non-Managerial	Same Field	Different fields	Managerial	Non-Managerial
Log Monthly Earnings	9.0090 (1.4725)	8.8809 (1.5596)	9.8103 (0.7574)	8.8778 (0.6704)	7.6361 (3.0454)	8.3770 (1.6369)	9.4381 (0.6822)	8.4540 (0.5839)
Education	10.818 (4.1397)	10.692 (3.8173)	13.511 (3.0770)	9.5309 (3.9536)	9.9851 (4.1765)	10.062 (3.9774)	13.086 (3.0150)	8.8352 (3.7289)
Spouse's Education	9.9851 (4.1765)	10.062 (3.9774)	13.086 (3.0150)	8.8352 (3.7289)	10.818 (4.1397)	10.692 (3.8173)	13.511 (3.0770)	9.5309 (3.9536)
Experience	24.251 (11.727)	23.391 (10.833)	20.458 (9.9839)	25.857 (12.082)	21.025 (10.491)	19.808 (9.7820)	16.983 (8.4060)	22.108 (10.668)
Experience^2	725.40 (664.72)	664.34 (592.82)	517.68 (502.69)	814.19 (708.60)	551.93 (539.89)	487.94 (483.61)	358.67 (353.16)	602.24 (566.90)
Log Other Cash Income	0.9402 (2.6005)	0.6835 (2.3008)	1.6668 (3.3052)	0.5775 (2.0576)	0.7431 (2.2634)	0.3969 (1.7604)	1.3206 (2.9113)	0.2855 (1.3712)
N	606	855	201	405	606	855	201	405

Notes: Married sample is divided into sample of the same field and sample of different fields.
Sample of the same field contains observations who are working in the similar industries with his or her spouse.
Sample of different fields contains observations who are working in the dissimilar industries with his or her spouse.
Sample of the same field is divided into sample of managerial class and sample of non-managerial class.

Table 4.1 Means (Standard Deviations) of Variables

	Husbands		Wives		
Variable	Working sample I	Working sample II	Working sample I	Eligible population sample	Working sample II
Log Wage Rate (Hourly)	4.4793 (0.61023)	4.5269 (1.9151)	3.8466 (0.7082)	-	3.9579 (0.6834)
Age	48.609 (6.7527)	42.804 (9.1151)	46.164 (5.3264)	-	38.363 (7.6689)
Education	10.265 (5.6114)	10.094 (4.0603)	8.4020 (4.3938)	-	8.4095 (4.3940)
Spouse's Education	-	8.4932 (4.1149)	-	7.9334 (4.3898)	10.023 (4.2362)
Experience	-	17.794 (12.940)	-	22.565 (8.8659)	17.263 (11.366)
Age at Marriage	22.781 (3.3695)	27.310 (4.8978)	22.665 (3.4667)	-	23.166 (3.3396)
Education* Duration of Marriage	-	106.19 (70.133)	-	-	108.39 (94.429)
Wife-Father's Wealth Dummy	-	-	-	0.66118 (0.4735)	-
Preschool Children Dummy	-	-	-	0.3413 (0.4743)	-
Wife-Mother's Education	-	-	-	1.8651 (3.1414)	-
N	808	1537	439	1216	1111

Table 4.2: Estimates of Age at Marriage Equations

Variable	Husbands	Wives
Log Hourly Wage Rate	0.92615 (4.199)	0.07327 (0.3391)
Age	-0.09409 (5.676)	-0.67844 (0.2738)
Education	0.05281 (1.497)	0.05281 (1.497)
Constant	22.705 (18.58)	22.705 (15.58)
R^2	0.0960	0.0960
N	808	439

Notes: Absolute value of t-statistics are in parentheses.

Table 4.3: Probit Estimates and Estimates of Log Wage Rate Equations

	Husbands	Wives	
Variable	Log Wage Rate Equation Estimates	Probit Equation Estimates	Log Wage Rate Equation Estimates
Experience	0.2956×10^{-1} (4.215)	-0.0152 (0.6225)	0.7122×10^{-2} (0.9068)
$Experience^2$	-0.4740×10^{-3} (4.499)	0.3534×10^{-4} (0.0992)	-0.1144×10^{-5} (0.0093)
Education	0.0389 (7.826)	0.04729 (2.7747)	0.0557 (7.351)
Spouse's Education	0.03240 (6.199)	-	0.2263 (3.136)
Spouse's Education* Duration of Marriage	0.3833×10^{-3} (1.213)	-	0.8332×10^{-4} (0.2107)
Constant	3.4300 (25.78)	0.9628 (2.0183)	3.2483 (47.53)
Inverse Mill's Ratio	-	-	-0.4797 (1.720)
Father-in-law's Wealth Dummy	-	-0.1661 (1.8315)	-
Mother's Education	-	0.0361 (2.0677)	-
Presence of Preschool Children	-	-0.2055 (1.5412)	-
R^2	0.2311	-	0.2302
N (working wives)	-	1111	-
N (non-working wives)	-	105	-
N	1537	1216	1111

Notes: Absolute value of t-statistics are in parentheses.

Table 4.4 Married Women Labor Supply

(Weekly Working Hours) Equation Estimate

Variable	Married Women (Labor supply function 4.4)
Predicted Log Wage	-9.4425 (1.966)
Log Dowry	0.33690 (0.4076)
Age	-1.0483 (0.8397)
Age^2	0.01292 (0.8404)
Preschool Children	-2.6417 (1.986)
Husband's Monthly Earnings	-0.4235 (1.806)
Inverse Mill's Ratio	-4.867 (0.2886)
Constant	108.7 (3.700)
R^2	0.0134
N	555

Notes: Absolute value of t-statistics are in parentheses.

Table 4.5: Means (Standard Deviations) of Variables

Variable	Married Women
Weekly Working Hours	51.586 (18.945)
Wives' Monthly Earnings	12878 (9205.1)
Nominal Value of Dowry	89364 (0.18441×10^{-6})
Predicted Log Wage of Wives	3.9330 (0.3276)
Log Real Value of Dowry	6.5598 (1.1915)
Age	37.939 (7.2962)
Age^2	1492.5 (587.76)
Presence of Preschool Children	0.3568 (0.4795)
Husband's Monthly Earnings	18583 (14703)
Inverse Mill's Ratio	0.31782 (0.1194)
N	555